

On page 5, please replace the second paragraph with the following:

This form adaptability can be observed when any pressurization acting on the expanded graphite particles at least partially overlying on each other makes the particles deformed mutually and bonded to each other at least partially depending on the pressurizing state.

Please replace the paragraph bridging pages 9 and 10 with the following:

The lengths (thicknesses) of the flexible inorganic electrically conductive particles and inorganic electrically conductive fibers in the pressurization direction are measured. A sample, in which the particles and the fibers are overlaid in the pressurization direction, is prepared. The sample is placed between the sample holding flat faces of two indenters located in opposite to each other in the vertical direction. The indenters are actuated to pressurize the sample, and after the length (sample thickness) in the pressurization direction becomes 80% of that before pressurization, the pressurization is released. The sample is taken out, and the respective lengths of the flexible inorganic electrically conductive particles and the inorganic electrically conductive fibers in the pressurization direction after completion of pressurization are measured. Then, the decrement L_p of the length (thickness) of the flexible inorganic electrically conductive particles and the decrement L_f of the length (thickness) of the inorganic electrically conductive fibers due to the pressurization are substituted into the following formula, to obtain the deformation degree D_{pf} .

$$D_{pf} = L_f/L_p$$

Marked-Up Version Showing Changes Made to the Claims

15. (Twice Amended) A porous conductive sheet comprising:
inorganic electrically conductive fibers,
adhesive imparting material, and
expanded graphite particles adhered to the inorganic electrically conductive fibers with the
adhesive imparting material and disposed to form a sheet, wherein the surfaces of the expanded
graphite particles are recessed at the contact faces between the inorganic electrically conductive
fibers and the expanded graphite particles.

21. (Twice Amended) A porous conductive sheet according to any one of claims 15 through
20, wherein the inorganic electrically conductive fibers are carbon fibers.

22. (Twice Amended) A porous conductive sheet according to any one of claims 15 through
24, which has an electric resistance of 150 mΩ•cm² or less.

23. (Twice Amended) A porous conductive sheet according to any one of claims 15 through
22, which has a thickness of 0.02 to 0.3mm and a unit weight of 10 to 220 g/m²

24. (Twice Amended) A porous conductive sheet according to any one of claims 15 through
23, which has a tensile strength of 0.49 N/10mm width.

25. (Twice Amended) A porous conductive sheet according to any one of claims through 12
and claims claim 15 through 24, which is used as a current collector of a fuel cell.

26. (Twice Amended) A current collector for a fuel cell, comprising the use of the porous
sheet as set forth in any one of claims through 12 and claims claim 15 through 24.

29. (Amended) A fuel cell, comprising the unit as set forth in claim 27 or 28.

31. (Twice Amended) A method for producing the porous conductive sheet as set forth in any
one of claims 1 through 12 and claims claim 15 through 24 comprising the step of pressurizing
the porous conductive sheet in the a direction perpendicular to the a surface of the sheet in the a
step of forming the porous conductive sheet.

Please add the following new claims:

32. (New) A fuel cell, comprising the unit as set forth in claim 28.
33. (New) A movable body, mounted with the fuel cell as set forth in claim 32.
34. (New) A porous conductive sheet according to claim 15, wherein the pressure loss of the sheet is 40 mm Aq or less at where air is caused to permeate at 14 cm/sec in the thickness direction in the state where no surface pressure acts on the sheet surface in the thickness direction.

Please cancel Claims 3-12, 17 and 18 without prejudice and without disclaimer of the subject matter contained therein.

Remarks

The Applicants acknowledge the objection to Claims 8-12 and 20-31. Claims 8-12 have been canceled. The Applicants have amended Claims 20-31 so that they are no longer multiple dependent and are in proper form. Examination on the merits is respectfully requested.

The Applicants note with appreciation the Examiner's helpful comments/questions concerning Claims 3, 5-6, 15 and 17-18 with respect to §1 12. Claims 3, 5-6 and 17-18 have been canceled and Claim 15 has been amended to provide appropriate antecedent basis for "contact basis". Withdrawal of the 35 U.S.C. §1 12 rejection of Claim 15 is accordingly respectfully requested.

New Claims 32-34 have been added.

Claim 15 has also been amended to recite that the porous conductive sheet also comprises an adhesiveness imparting material. Support may be found throughout the specification such as on page 11 at lines 5-7.

Turning now to the merits, Applicants acknowledge the rejection of Claims 3-7 and 15-21 over the hypothetical combination of JP '897 with JP '265. (The Applicants note that the Official Action refers to JP 8-00797. This is believed to be a typographical error and the reference should be JP 8-007897. The remarks set forth below are based on such assumption.)

The Applicants respectfully submit that one of ordinary skill in the art would not make the hypothetical combination of JP '897 with JP '265. Unfortunately, the teachings of JP '897 and JP '265 lead those of ordinary skill in the art in essentially opposite directions. JP '897 includes a gas diffusion layer made of carbon particles and water-repellent resin formed by sticking carbon short fibers with the carbon particles. The water-repellent resin serves double duty inasmuch as it acts as an adhesive material in addition to its water-repellency characteristics. This is supported by the attached Declaration of Mr. Mikio Inoue, one of the inventors herein. As a consequence, JP '897 clearly takes advantage of the adhesive characteristics imparted by the water-repellent material.

This is in sharp contrast to JP '265, which avoids the use of an adhesive binder altogether. In that regard, we enclose a partial English translation of JP '265 which clearly demonstrates this fact. JP '265 seeks to avoid the use of binder adhesives, which is sharp contrast to the diffusion layer of JP '897, which utilizes a water-repellent resin that also acts as a binder adhesive material. Accordingly, one of ordinary skill in the art would have no incentive to hypothetically combine JP '265 with JP '897 in view of these opposed teachings. Of course, it is fundamental in the law that a §103 rejection cannot be maintained in view of references that teach in opposite directions. Moreover, it is fundamental that, not only must there be a motivation to make the combination, but that there be a reasonable expectation of success in the prior art for the obviousness rejection to stand. In this case, there is not only no reasonable expectation of success if the hypothetical combination were to be made, but the opposed teachings would lead one of ordinary skill in the art to have a reasonable expectation of no success. This is because one of ordinary skill in the art would understand that a primary aspect of JP '265 (avoidance of binders/adhesives) would be destroyed by the combination. Therefore, we respectfully submit that one of ordinary skill in the art would not hypothetically combine JP '265 with JP '897. Withdrawal of the 35 U.S.C. §103 rejection as it applies to Claim 15, together with claims depending therefrom, is respectfully requested.

In light of the foregoing, we respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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In the Specification (clean copy as amended)

On page 3, please replace the second paragraph with the following:

It is demanded to develop a current collector that is not only good in the function of collecting the electric current and in the function of allowing the materials participating in the electrode reaction to be diffused and permeate, but also unlikely to be damaged in the current collector production process and in the process until the current collector is installed in the cell, i.e., good in handling convenience, and also low in electric resistance. It is also desired that such a current collector can be produced at a low cost.

On page 5, please replace the first paragraph with the following:

Expanded graphite particles per se can be highly deformed. This nature can be expressed by a word, flexibility. This flexibility can be observed as the form adaptability of the expanded graphite particles to another body that exists adjacent to the expanded graphite particles.

On page 5, please replace the second paragraph with the following:

This form adaptability can be observed when any pressurization acting on the expanded graphite particles at least partially overlying each other makes the particles deformed mutually and bonded to each other at least partially depending on the pressurizing state.

Please replace the paragraph bridging pages 9 and 10 with the following:

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and the decrement L_f of the length (thickness) of the inorganic electrically conductive fibers due to the pressurization are substituted into the following formula, to obtain the deformation degree D_{pf} .

$$D_{pf} = L_f L_p$$

In the Claims (clean copy as amended)

15. (Twice Amended) A porous conductive sheet comprising:
inorganic electrically conductive fibers,
adhesive imparting material, and
expanded graphite particles adhered to the inorganic electrically conductive fibers with
the adhesive imparting material and disposed to form a sheet, wherein surfaces of the expanded
graphite particles are recessed at contact faces between the inorganic electrically conductive
fibers and the expanded graphite particles.
21. (Twice Amended) A porous conductive sheet according to claim 15, wherein the inorganic
electrically conductive fibers are carbon fibers.
22. (Twice Amended) A porous conductive sheet according to claim 15, which has an electric
resistance of $150 \text{ m}\Omega \cdot \text{cm}^2$ or less.
23. (Twice Amended) A porous conductive sheet according to claim 15, which has a thickness
of 0.02 to 0.3mm and a unit weight of 10 to 220 g/m²
24. (Twice Amended) A porous conductive sheet according to claim 15, which has a tensile
strength of 0.49 N/10mm width.
25. (Twice Amended) A porous conductive sheet according to claim 15, which is used as a
current collector of a fuel cell.
26. (Twice Amended) A current collector for a fuel cell, comprising the use of the porous
sheet as set forth in claim 15 .
29. (Amended) A fuel cell, comprising the unit as set forth in claim 27.
31. (Twice Amended) A method for producing the porous conductive sheet as set forth in
claim 15 comprising pressurizing the porous conductive sheet in a direction perpendicular to a
surface of the sheet in a step of forming the porous conductive sheet.

Please add the following new claims:

32. (New) A fuel cell, comprising the unit as set forth in claim 28.
33. (New) A movable body, mounted with the fuel cell as set forth in claim 32.
34. (New) A porous conductive sheet according to claim 15, wherein the pressure loss of the sheet is 40 mm Aq or less at where air is caused to permeate at 14 cm/sec in the thickness direction in the state where no surface pressure acts on the sheet surface in the thickness direction.

Please cancel Claims 3-12, 17 and 18 without prejudice and without disclaimer of the subject matter contained therein.